



Milliman USA
Consultants and Actuaries

111 SW Fifth Avenue, Suite 2900
Portland, OR 97204-3690
Tel +1 503 227.0634
Fax +1 503 227.7956
www.milliman.com

April 18, 2002

Retirement Board
California State Teachers' Retirement System

**Re: Defined Benefit Program
Actuarial Valuation as of June 30, 2001**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Defined Benefit Program of the State Teachers' Retirement Plan as of June 30, 2001. Details about the actuarial valuation are contained in the following report.

I certify that the information included in this report is complete and accurate to the best of my knowledge and belief. All calculations have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the applicable Standards of Practice adopted by the American Academy of Actuaries.

Milliman USA has been engaged by CalSTRS as an independent actuary. The undersigned is a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, and an Enrolled Actuary, and is experienced in performing actuarial valuations for large public employee retirement systems.

Respectfully submitted,

Mark O. Johnson, F.S.A., M.A.A.A., E.A.
Principal and Consulting Actuary

MOJ:j



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE OF CONTENTS

LETTER OF TRANSMITTAL

1. EXECUTIVE SUMMARY
2. FINDINGS OF THE ACTUARIAL VALUATION
 - Table 1 Normal Cost
 - Table 2 Actuarial Obligation
 - Table 3 Statement of Program Assets
 - Table 4 Statement of Changes in Program Assets
 - Table 5 Actuarial Value of Assets
 - Table 6 History of Actuarial Value of Assets
 - Table 7 Bifurcated Assets
 - Table 8 Funded Status
 - Table 9 Actuarial Gains and Losses
 - Table 10 Contributions
 - Table 11 Funding Sufficiency for 1990 Benefit Structure
 - Table 12 30-Year Projection of Contributions
 - Table 13 Amortization of Unfunded Actuarial Obligation
 - Table 14 Funding Sufficiency for DB Program
3. OUTLINE OF THE PROVISIONS OF GOVERNING LAW
4. ACTUARIAL METHODS AND ASSUMPTIONS
 - Table 15 Outline of Actuarial Assumptions
 - Table 16 Mortality Rates
 - Table 17 Service Retirement
 - Table 18 Disability Retirement
 - Table 19 Withdrawal
 - Table 20 Probability of Refund
 - Table 21 Merit Salary Increases
5. VALUATION DATA
 - Table 22 Summary of Statistical Information
 - Table 23 Active Male Members
 - Table 24 Active Female Members
 - Table 25 All Active Members
 - Table 26 Inactive Members
 - Table 27 Service Retirants
6. GLOSSARY OF ACTUARIAL TERMINOLOGY



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

SECTION 1 EXECUTIVE SUMMARY

The primary purpose of the actuarial valuation is to analyze the sufficiency of future contributions from members, employers, and the State, to meet the current and future obligations of the Defined Benefit (DB) Program. By using the actuarial methods and assumptions adopted by the Retirement Board, this actuarial valuation provides the best estimate of the long-term financing of the DB Program. Certain information in accordance with the Governmental Accounting Standards Board Statement No. 25 will be provided separately.

There is a statutory requirement to separately track the funding level of the benefits that were in effect as of July 1, 1990. Therefore, the presentation of our results shows liabilities separately for both the entire Program and for the benefits in effect as of July 1, 1990 (the 1990 Benefit Structure).

The prior valuation did not include the impact of the 2000 Benefits Increase that became effective after the June 30, 2000 valuation date. Subsequent analyses submitted to the Retirement Board disclosed our estimate of the impact of the 2000 Benefits Increase. The provisions of the 2000 Benefits Increase included in this valuation are as follows:

- Ad hoc retiree benefit increases,
- One-Year Final Compensation for members with 25 years of service,
- Longevity Bonus for members with 30 years of service by January 1, 2011,
- Redirection of certain member contributions to the DBS Program,
- Redirection of certain employer contributions to the TRBF, and
- Refinancing of State contributions.

Our findings indicate that, as of June 30, 2001, the expected future revenue for the DB Program is expected to be sufficient to finance its obligations. However, by comparison, the DB Program is not as well funded as it was the previous year, due primarily to investment returns during the year being less than the long-term actuarial assumption of 8% per year.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

SECTION 2

FINDINGS OF THE ACTUARIAL VALUATION

The findings have been determined according to actuarial assumptions that were adopted by the Retirement Board prior to the 1999 valuation. They were selected on the basis of recent experience and current expectations of future experience. In our opinion, the assumptions used in this valuation are reasonably related to the past experience of the DB Program and represent our best estimate of future conditions affecting the Program. Nevertheless, the emerging costs of the DB Program will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions.

DETERMINATION OF NORMAL COST

The **Normal Cost** represents the cost assigned to an average member for a given year such that it would meet the continuing costs of that particular benefit if contributed each year starting with the date of membership. The Entry Age Actuarial Cost Method is designed to produce a Normal Cost that remains a level percentage of salaries, so it is best expressed as a rate.

The following chart shows the Normal Cost has increased from 16.001% to 16.497% since the last valuation. Our report dated April 18, 2001 indicated the Normal Cost Rate increased by 0.422% due to the passage of the 2000 benefit enhancement legislation. Therefore, the Normal Cost Rate experienced only a slight increase from 16.423% to 16.497% due to experience. **TABLE 1** provides more details on calculation of the Normal Cost and Normal Cost Rates. In order to test the financing of the benefits in effect in July of 1990, we have calculated the Normal Cost separately for those benefits.

	Amount (\$Millions)	Percent of Earned Salaries
Total DB Program		
2000 Valuation	\$ 2,916	16.001%
2000 Valuation (with enhanced benefits)	\$ 3,006	16.423%
2001 Valuation	\$ 3,396	16.497%
1990 DB Program Benefits		
2000 Valuation	\$ 2,527	13.866%
2001 Valuation	\$ 2,893	14.054%



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

The Normal Cost Rate is expected to remain fairly stable as a percentage of Earned Salaries as long as the benefit provisions are not amended, membership experience emerges as assumed, and the demographic characteristics of the membership remain reasonably consistent. The change in the Normal Cost Rate is well within expected levels of fluctuation.

DETERMINATION OF THE ACTUARIAL OBLIGATION

The next step in the actuarial valuation process is to project all future DB Program benefit payments for current members and retirees. The level of benefits currently being paid is known, but assumptions are needed to estimate how long they will be paid, and the amount and timing of the payment of future benefits for active and inactive members who are not currently receiving payments. The summation of the discounted values of all of the projected benefit payments for all current members, at the assumed rate of return, is called the **Actuarial Present Value of Projected Benefits**. Details are shown in **TABLE 2** and summarized below.

<i>(\$Millions)</i>	<u>Total DB Program</u>		<u>1990 DB Program Benefits</u>	
	June, 2001	June, 2000	June, 2001	June, 2000
Benefits Currently Being Paid	\$ 41,513	\$ 36,238	\$ 38,854	\$ 35,386
Inactive Deferred Benefits	2,080	1,810	2,053	1,793
Active Members' Benefits	<u>106,963</u>	<u>90,014</u>	<u>87,194</u>	<u>77,771</u>
Value of Projected Benefits	\$150,556	\$128,062	\$128,101	\$114,950
Value of Future Normal Costs	<u>40,675</u>	<u>34,938</u>	<u>33,839</u>	<u>29,713</u>
Actuarial Obligation	\$109,881	\$ 93,124	\$ 94,262	\$ 85,237

The **Actuarial Present Value of Future Normal Costs** is the value of all remaining Normal Costs expected to be received over the future working lifetime of current active members. The **Actuarial Obligation** is the difference between the Actuarial Present Value of Projected Benefits and the Actuarial Present Value of Future Normal Costs. The Actuarial Obligation is equal to the assets that would exist if the current Normal Cost Rate had been paid for all members since entry into the Program, and if all experience had emerged as assumed.

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

The next step in the valuation process is to calculate the **Actuarial Value of Assets** that will be used to determine the funding status of the Program. As shown in **TABLE 3**, the market value of assets was reported as \$102,915 million as of June 30, 2001, down from \$112,771 million as of June 30, 2000. **TABLE 4** shows the asset changes for the year.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

Because the underlying calculations in the actuarial valuation are long-term in nature, it is advantageous to use an asset smoothing method to lessen the impact of short-term fluctuations in the value of assets. The asset smoothing method projects an Expected Value of Assets using the assumed rate of investment return, then recognizes only one-third of the difference between the Expected Value and the Market Value to arrive at the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in **TABLE 5** and summarized below. **TABLE 6** shows a history of the Actuarial Value of Assets compared to the Fair Market Value of Assets. This is the first year since 1994 that the Actuarial Value has exceeded the Fair Market Value.

<i>(\$Millions)</i>	June 30, 2001	June 30, 2000
Fair Market Value	\$102,915	\$112,771
Actuarial Value of Assets		
Based on Actual Earnings	\$108,571	\$102,790
Less the SBMA Reserve	<u>917</u>	<u>565</u>
Actuarial Value for DB Program	\$107,654	\$102,225
Less Bifurcated Assets	<u>896</u>	<u>574</u>
Allocated to 1990 Benefits	\$106,758	\$101,651

Future benefits provided through the Supplemental Benefits Maintenance Account (SBMA) are not part of the projected benefits included in this valuation. Therefore, the SBMA Reserve is subtracted from the DB Program assets to arrive at the value available to support the benefits included in this valuation.

Under State law, if the Actuarial Value of Assets associated with the benefit provisions in effect as of July 1, 1990 is less than the Actuarial Obligation for those benefits, or if the contributions from the member and 8% from the employers are not sufficient to pay the Normal Cost of the benefits in effect as of July 1, 1990, additional funds would be contributed by the State. The assets accumulated for the post-1990 benefit increases must be calculated separately and subtracted from the total assets to test the financing of the 1990 DB Program Benefits.

There were no benefit improvements enacted between 1990 and 1998 that had a material cost. Based on contributions started on October 1, 1998, additional benefits paid out due to the post-1990 benefit increases up to June 30, 2001, and earnings on the accumulated assets, we estimate the actuarial value of funds accumulated for the post-1990 benefit increases to be \$896 million as of June 30, 2001. See **TABLE 7** for the details.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

FUNDED STATUS

The **Unfunded Actuarial Obligation** is the excess of the Actuarial Obligation over the Actuarial Value of Assets, which represents a liability that must be funded over time. Contributions in excess of the Normal Cost are used to amortize the Unfunded Actuarial Obligation. An **Actuarial Surplus** exists if the Actuarial Value of Assets exceeds the Actuarial Obligation. The following is shown in **TABLE 8**.

<i>(\$Millions)</i>	<u>Total DB Program</u>		<u>1990 DB Program Benefits</u>	
	June, 2001	June, 2000	June, 2001	June, 2000
Actuarial Obligation	\$109,881	\$ 93,124	\$ 94,262	\$ 85,237
Actuarial Value of Assets	<u>107,654</u>	<u>102,225</u>	<u>106,758</u>	<u>101,651</u>
Unfunded Actuarial Obligation	\$ 2,227	\$ (9,101)	\$ (12,496)	\$ (16,414)
Funded Ratio	98%	110%	113%	119%

ACTUARIAL GAINS AND LOSSES

Comparing the Unfunded Actuarial Obligation as of two valuation dates does not provide enough information to determine if there were actuarial gains or losses. The correct comparison is between the Unfunded Actuarial Obligation on the valuation date and the Expected Unfunded Actuarial Obligation projected from the prior valuation date using the actuarial assumptions in effect since the previous valuation. The actuarial gains and losses since the 2000 valuation are shown below with more detail disclosed in **TABLE 9**.

	<i>(\$Millions)</i>
Actuarial (Gains) and Losses	
Net Loss from Net Investment Experience	\$ 6,421
Improved Data	250
New Entrants or Rehired Members	353
Salaries Increased more than Assumed	3,143
All Other Sources	<u>256</u>
Net Loss from All Sources	\$ 10,423

Table 9 shows the Actuarial Obligation as of June 30, 2000, and the elements to project that figure forward to June 30, 2001: the \$5,606 million impact of the 2000 Benefits Increase, the Normal Cost, less benefits paid, plus a charge for interest at the assumed rate of 8% per year. The majority of the \$4,002 million net loss is due to salary increases exceeding the assumed rate. All other non-investment experience represents only a relatively small portion of the expected Actuarial Obligation. The relatively small



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

loss indicates that the census is consistent from the prior period, and the actual experience (except for salaries) tracked closely with the actuarial assumptions.

As calculated in Table 9, the expected market value as of June 30, 2001, assuming the fund had earned 8% for the year, was \$122,179 million. After smoothing, the actuarial value would have been \$114,075 million if the DB Program had earned 8% for the year. The difference of \$6,421 million (the expected value of \$114,075 million, less the actual value of \$107,654 million) represents the loss in the Actuarial Value of Assets due to the partial recognition of the 2000-01 investment losses.

FUNDING SUFFICIENCY FOR 1990 BENEFIT STRUCTURE

The contributions from members at the rate of 8.00% of Earned Salaries, and from the School Districts at the rate of 8.00% of Earned Salaries, are available to finance the 1990 Benefit Structure. An additional amount would be paid by the State to fund the difference between the Normal Cost and the member and employer contributions, and to finance the Unfunded Actuarial Obligation, if any, of the benefits in effect on July 1, 1990. As in the prior studies, note that all benefits enacted with effective dates between July 1, 1990 and December 31, 1998 are presumed to be cost-neutral. The first part of **TABLE 10** is shown below.

1990 Benefit Structure		
EC 22901	Members - permanent contribution	8.000%
EC 22950	Employers - permanent contribution	8.000
EC 22955(b)	State – Normal Cost Deficit	<u>0.000</u>
Total for Normal Cost		16.000%

Deposits attributable to 16% of Earned Salaries from the members and employers are used to fund the benefits in place on July 1, 1990. If needed, some additional funding is available for these benefits from the State. Since the bifurcated 1990 Benefit Structure continues to have an Actuarial Surplus, and the associated Normal Cost Rate is less than 16% of Earned Salaries, the statutory financing arrangement for the 1990 Benefit Structure is currently sufficient.

FUNDING SUFFICIENCY FOR DB PROGRAM

Beginning in July of 2000 and as reflected in this valuation, all contributions fund all of the obligations of the DB Program, except that the funding for the benefits in effect on July 1, 1990 is limited as described above.

The contributions to fund the DB Program include those listed above for the 1990 Benefit Structure, 0.25% of salaries from employers, plus a contribution from the State.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

The State contribution is 1.975% of the prior calendar year Earned Salaries through June of 2003. After that time, the contribution will be 2.017% of the second preceding fiscal year Earned Salaries. For example, the State contribution for the 2003-04 will be equal to 2.017% of the 2001-02 Earned Salaries.

There are two temporary reductions to this source of contributions. Twenty-five percent of the members' contributions are directed to the Defined Benefit Supplement Program (DBS) through December of 2010. In addition, funding for the Teachers' Health Benefits Fund (THBF) is directed as needed from the employer contributions.

The lower portion of Table 10, shown below, shows the current rate of contribution and an equivalent level rate for each based on the present value of future contributions over the next thirty years. The calculation of the equivalent rates is shown in **TABLE 12**.

DB Program		Current Rate	Equivalent Rate
EC 22901	Members	8.000%	8.000%
EC 22901.5	Directed to DBS Accounts	(2.000)	(0.872)
EC 22950	Employers	8.000	8.000
EC 22950 (c)	Employers for THBF	<i>pay-as-you-go</i>	(0.121)
EC 22951	Employers	0.250	0.250
EC 22955 (a)	State	1.975	1.860
EC 22955 (b)	State – 1990 Benefit Structure	0.000	<u>0.000</u>
Equivalent Level Contribution Rate over 30-Year Period			17.117%

TABLE 13 shows the amortization of the Unfunded Actuarial Obligation on a year-by-year basis. Based on the current Actuarial Value of Assets, and all future experience emerging as assumed, the Unfunded Actuarial Obligation will be amortized over the next 29 years. **TABLE 14** summarizes these findings.

A level contribution rate of 17.082% of Earned Salaries would be required to fund the Normal Cost and amortize the Unfunded Actuarial Obligation over the next 30 years.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

**TABLE 1
NORMAL COST**

<i>(\$Millions)</i>	<u>Total DB Program</u>		<u>1990 DB Program Benefits</u>	
	June, 2001	June, 2000	June, 2001	June, 2000
Estimated Annual Earned Salaries	\$ 20,585	\$ 18,224	\$ 20,585	\$ 18,224
Present Value of Future Normal Costs for Current Active Members	\$ 40,675	\$ 34,938	\$ 33,839	\$ 29,713
Present Value of Future Earned Salaries for Current Active Members	\$246,548	\$218,346	\$240,776	\$214,289
Annual Normal Cost				
Retirement	\$ 3,052	\$ 2,615	\$ 2,556	\$ 2,232
Disability	153	128	151	126
Death	54	48	49	44
Withdrawal	<u>137</u>	<u>125</u>	<u>137</u>	<u>125</u>
Total Normal Cost	\$ 3,396	\$ 2,916	\$ 2,893	\$ 2,527
Normal Cost Rate Percent of Earned Salaries	16.497%	16.001%	14.054%	13.866%



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

**TABLE 2
ACTUARIAL OBLIGATION**

<i>(\$millions)</i>	<u>Total DB Program</u>		<u>1990 DB Program Benefits</u>	
	June, 2001	June, 2000	June, 2001	June, 2000
Present Value of Projected Benefits to All Current Members				
Benefits Currently Being Paid				
Service Retirement	\$ 37,699	\$ 33,230	\$ 35,199	\$ 32,382
Disability	1,408	1,126	1,361	1,126
Survivors	<u>2,406</u>	<u>1,882</u>	<u>2,294</u>	<u>1,878</u>
Total	\$ 41,513	\$ 36,238	\$ 38,854	\$ 35,386
Benefits to Inactive Members	2,080	1,810	2,053	1,793
Benefits to Active Members				
Retirement	\$102,262	\$ 85,917	\$ 82,804	\$ 73,920
Disability	2,563	2,152	2,477	2,097
Death	1,495	1,350	1,271	1,159
Withdrawal	<u>643</u>	<u>595</u>	<u>642</u>	<u>595</u>
Total	\$106,963	\$ 90,014	\$ 87,194	\$ 77,771
Total Present Value of Benefits	\$150,556	\$128,062	\$128,101	\$114,950
Present Value of Future Normal Costs	<u>40,675</u>	<u>34,938</u>	<u>33,839</u>	<u>29,713</u>
Actuarial Obligation	\$109,881	\$ 93,124	\$ 94,262	\$ 85,237



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 3
STATEMENT OF PROGRAM ASSETS

<i>(\$Millions)</i>	June, 2001	June, 2000
Invested Assets		
Short-term	\$ 2,344	\$ 1,560
Debt Securities	28,815	27,232
Equity	61,283	73,641
Alternative	4,490	5,106
Real Estate	<u>5,273</u>	<u>3,771</u>
Total Investments ⁽¹⁾	\$102,205	\$111,310
Cash and Cash Equivalents	5	3
Receivables	3,849	4,816
Liabilities ⁽¹⁾	<u>(3,144)</u>	<u>(3,358)</u>
Fair Market Value of Net Assets	\$102,915	\$112,771

Note:

⁽¹⁾ Excludes offsetting entries from Securities Lending Collateral and Obligation



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 4
STATEMENT OF CHANGES IN PROGRAM ASSETS

<i>(\$Millions)</i>	June, 2001	June, 2000
Contributions		
Members	\$ 1,630	\$ 1,530
Employers	1,881	1,589
State of California	<u>946</u>	<u>939</u>
Total Contributions	4,457	4,058
Benefits and Expenses		
Retirement, Death, and Survivors	(3,765)	(3,435)
Refunds of Member Contributions	(77)	(80)
Purchasing Power Benefits	(189)	(191)
Administrative Expenses	<u>(55)</u>	<u>(51)</u>
Total Benefits and Expenses	(4,086)	(3,757)
Net Cash Flow	\$ 371	\$ 301
Investment Income		
Realized Income	\$ 3,245	2,861
Unrealized Gains or Losses	(13,457)	9,835
Net Securities Lending Income	70	55
Investment Expenses	<u>(85)</u>	<u>(61)</u>
Net Investment Return	(10,227)	12,690
Net Increase	\$ (9,856)	\$ 12,991
Fair Market Value of Net Assets		
Beginning of Year	<u>112,771</u>	<u>99,780</u>
End of Year	\$102,915	\$112,771



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 5
ACTUARIAL VALUE OF ASSETS

<i>(\$Millions)</i>	June, 2001	June, 2000
Actuarial Value at Beginning of Year	\$102,790	\$ 90,265
Contributions	4,457	4,058
Benefits and Expenses	(4,086)	(3,757)
Expected Return at 8%	<u>8,238</u>	<u>7,233</u>
Expected Actuarial Value End of Year	\$111,399	\$ 97,799
Fair Market Value	<u>102,915</u>	<u>112,771</u>
Difference between Fair Market Value and Expected Actuarial Value	\$ (8,484)	\$ 14,972
Recognition Factor	One-third	One-third
Recognized Gain or Loss	\$ (2,828)	\$ 4,991
Actuarial Value at End of Year (Before SBMA Adjustment)	\$108,571	\$102,790
<i>(Expected Value plus Recognized Gain or Loss)</i>		
<i>Ratio of Actuarial Value of Assets to Fair Market Value of Assets</i>	<i>105%</i>	<i>91%</i>
Less, SBMA Reserve	<u>917</u>	<u>565</u>
Actuarial Value at End of Year (After SBMA Adjustment)	\$107,654	\$102,225
Estimated Net Rate of Return ⁽¹⁾	(9.1)%	12.7%

Note:

⁽¹⁾ Estimated return on Fair Market Value basis, net of all investment expenses and assuming uniform cash flow throughout the year



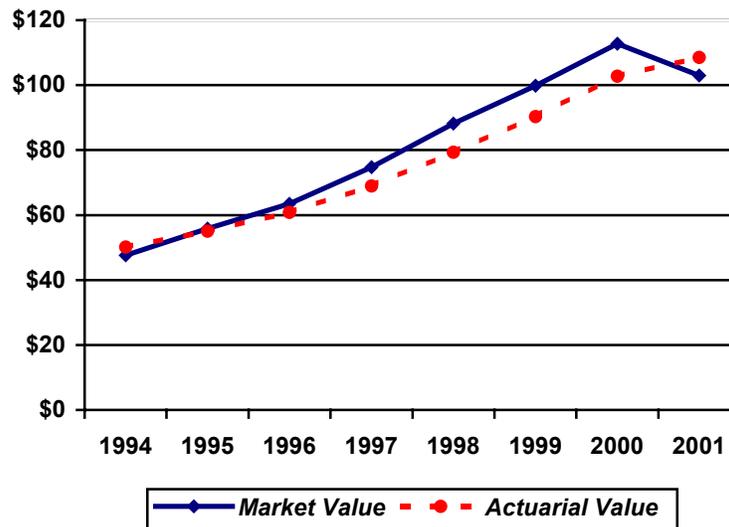
California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 6
HISTORY OF ACTUARIAL VALUE OF ASSETS

June 30 ⁽¹⁾	<i>(\$Millions) Before SBMA Adjustment</i>			Ratio of Actuarial to Market
	Fair Market Value	Estimated Return ⁽²⁾	Actuarial Value	
1994	\$ 47,631	0.3%	\$ 50,203	105%
1995	55,862	16.9	55,047	99
1996	63,455	13.3	60,876	96
1997	74,778	17.3	68,966	92
1998	88,198	17.3	79,381	90
1999	99,780	13.4	90,265	90
2000	112,771	12.7	102,790	91
2001	102,915	(9.1)	108,571	105

Note:

- (1) Asset Method adopted for 1999 valuation with retroactive calculation to July 1, 1993
- (2) Estimated return on Fair Market Value basis, net of all investment expenses and assuming uniform cash flow throughout the year





California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 7
BIFURCATED ASSETS

<i>(\$Millions)</i>	June, 2001	June, 2000
Assets Allocated to Post-1990 Benefit Increases		
Allocated Market Value at Beginning of Year	\$ 630	\$ 30
Contributions and Appropriations During the Year		
EC 22951 at 0.250% of salaries	51	46
EC 22955 at 3.102% of 1998 calendar year salaries		555
EC 22955 at 2.5385% of 1999 calendar year salaries	455	
Benefits Paid During the Year		
1998 Benefits Package	(66)	(33)
2000 Benefits Package	(153)	
Estimated Investment Earnings for the Year ⁽¹⁾	<u>(68)</u>	<u>32</u>
Total Allocated Market Value at End of Year	\$ 849	\$ 630
Ratio of Actuarial Value to Market Value ⁽²⁾	105.496%	91.149%
Actuarial Value of Assets for Post-1990 Benefit Increases	\$ 896	\$ 574

Note:

⁽¹⁾ Based on Fair Market Value and uniform cash flow for contributions, benefits, and expenses. Rate of return used was 12.70% for 1999-00 and -9.05% for 2000-01.

⁽²⁾ From Table 5



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

**TABLE 8
FUNDED STATUS**

<i>(\$Millions)</i>	<u>Total DB Program</u>		<u>1990 DB Program Benefits</u>	
	June, 2001	June, 2000	June, 2001	June, 2000
Actuarial Obligation <i>(Table 2)</i>	\$109,881	\$ 93,124	\$ 94,262	\$ 85,237
Actuarial Value of Assets				
Program Assets <i>(Table 5)</i>	107,654	102,225	107,654	102,225
Bifurcated Assets <i>(Table 7)</i>	n/a	n/a	(896)	(574)
Net Assets Available	107,654	102,225	106,758	101,651
Unfunded Actuarial Obligation (Actuarial Surplus)	\$ 2,227	\$ (9,101)	\$ (12,496)	\$ (16,414)
Funded Ratio	98%	110%	113%	119%



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

**TABLE 9
ACTUARIAL GAINS AND LOSSES**

<i>(\$Millions)</i>	Expected	Actual	(Gain) Loss
Actuarial Obligation			
Actuarial Obligation June 30, 2000	\$ 93,124		
2000 Benefits Increase	5,606		
Normal Cost	3,006		
Benefits Paid (Excludes Purchasing Power)	(3,842)		
Expected Interest at 8%	<u>7,985</u>		
Expected Actuarial Obligation	\$105,879	\$109,881	\$ 4,002
<i>By Source: Improved Data</i>			\$ 250
<i>New Entrants/Rehires</i>			353
<i>Salaries Increased More than Assumed</i>			3,143
<i>All Other Non-investment Sources</i>			<u>256</u>
<i>Total (Gain) Loss on the Actuarial Obligation</i>			\$ 4,002
Actuarial Value of Assets			
	<u><i>Fair Market</i></u>	<u><i>Actuarial</i></u>	
Value on June 30, 2000 (before SBMA offset)	\$112,771	\$102,790	
Contributions	4,457	4,457	
Benefits and Expenses	(4,086)	(4,086)	
Expected Interest at 8%	<u>9,037</u>	<u>8,238</u>	
Expected Value	\$122,179	\$111,399	
Expected Difference		\$ 10,780	
Recognized Difference (One-Third)		<u>3,593</u>	
Expected Value		\$114,992	
Less, Actual SBMA Reserve		<u>917</u>	
Actuarial Value of Assets		<u>114,075</u>	<u>107,654</u>
Unfunded Actuarial Obligation (Actuarial Surplus)	\$ (8,196)	\$ 2,227	\$ 10,423



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

**TABLE 10
CONTRIBUTIONS**

1990 Benefit Structure		
EC 22901	Members	8.000%
EC 22950	Employers	8.000
EC 22955 (b)	State (<i>up to 1.505%</i>) ⁽¹⁾	<u>0.000</u>
Total Contribution Rate for Normal Cost of 1990 Benefits		16.000%

DB Program		Current Rate	Equivalent Rate ⁽⁵⁾
EC 22901	Members	8.000%	8.000%
EC 22901.5	Directed to DBS Accounts ⁽²⁾	(2.000)	(0.872)
EC 22950	Employers	8.000	8.000
EC 22950 (c)	Employers for THBF ⁽⁴⁾	<i>as needed</i>	(0.121)
EC 22951	Employers	0.250	0.250
EC 22955 (a)	State ⁽³⁾	1.975	1.860
EC 22955 (b)	State ⁽¹⁾	0.000	<u>0.000</u>
Equivalent Level Contribution Rate over 30-Year Period			17.117%

Note:

- (1) Only used if Normal Cost Rate is greater than 16.000% of salaries for benefits in effect on July 1, 1990. Additional funding is required if the Unfunded Actuarial Obligation (related to the 1990 Benefit Structure) can not be amortized.
- (2) 25% of Member Contributions will be directed to Defined Benefit Supplement Accounts through December 31, 2010.
- (3) 1.975% paid quarterly based on prior calendar year salaries through June of 2003, then 2.017% paid quarterly thereafter based on second prior fiscal year salaries.
- (4) The Teachers' Health Benefit Fund is financed by a redirection of employer contributions. The equivalent rate is based on cash flow projections in fiscal impact study dated December 1, 2000.
- (5) Equivalent level contribution rate payable over the next 30 years. See TABLE 12 for details.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 11
FUNDING SUFFICIENCY FOR 1990 BENEFIT STRUCTURE

<i>(\$Millions)</i>	June, 2001	June, 2000
Funded Status (Table 8)		
Actuarial Obligation	\$ 94,262	\$ 85,237
Actuarial Value of Assets	<u>106,758</u>	<u>101,651</u>
Unfunded Actuarial Obligation or (Actuarial Surplus)	\$ (12,496)	\$ (16,414)
Funded Ratio	113%	119%
Normal Cost Deficit		
Normal Cost Rate (Table 1)	14.054%	13.866%
Contributions for Normal Cost (Table 10)	<u>16.000</u>	<u>16.000</u>
Normal Cost Deficit	0.000%	0.000%
Conclusion as of June 30, 2001:		
<ul style="list-style-type: none">• There is no Unfunded Actuarial Obligation, and• There is no Normal Cost Deficit since the Normal Cost Rate is less than 16% of Earned Salaries, therefore• State contributions from EC 22955(b) are not necessary at this time to fund the 1990 Benefit Structure of the DB Program.		



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 12
30-YEAR PROJECTION OF CONTRIBUTIONS

(\$Millions)							
FYE	Projected Salaries	Member 22901	Member DBS 22901.5	Employer 22950 & 22951	Employer THBF 22950(c)	State 22955(a)	Total Contrib.
2002	\$ 21,018	\$ 1,681	\$ (420)	\$ 1,734	\$ (38)	\$ 385	\$ 3,341
2003	21,911	1,753	(438)	1,808	(39)	431	3,514
2004	22,842	1,827	(457)	1,884	(39)	424	3,640
2005	23,813	1,905	(476)	1,965	(40)	442	3,796
2006	24,825	1,986	(497)	2,048	(40)	461	3,958
2007	25,880	2,070	(518)	2,135	(41)	480	4,127
2008	26,980	2,158	(540)	2,226	(42)	501	4,304
2009	28,127	2,250	(563)	2,320	(42)	522	4,488
2010	29,322	2,346	(586)	2,419	(43)	544	4,680
2011	30,568	2,445	(306)	2,522	(44)	567	5,185
2012	31,868	2,549		2,629	(44)	591	5,725
2013	33,222	2,658		2,741	(45)	617	5,970
2014	34,634	2,771		2,857	(45)	643	6,226
2015	36,106	2,888		2,979	(44)	670	6,493
2016	37,640	3,011		3,105	(43)	699	6,772
2017	39,240	3,139		3,237	(42)	728	7,062
2018	40,908	3,273		3,375	(41)	759	7,366
2019	42,646	3,412		3,518	(40)	791	7,682
2020	44,459	3,557		3,668	(38)	825	8,011
2021	46,348	3,708		3,824	(36)	860	8,355
2022	48,318	3,865		3,986	(35)	897	8,713
2023	50,372	4,030		4,156	(33)	935	9,087
2024	52,512	4,201		4,332	(31)	975	9,477
2025	54,744	4,380		4,516	(29)	1,016	9,882
2026	57,071	4,566		4,708	(28)	1,059	10,306
2027	59,496	4,760		4,908	(26)	1,104	10,747
2028	62,025	4,962		5,117	(24)	1,151	11,207
2029	64,661	5,173		5,335	(22)	1,200	11,686
2030	67,409	5,393		5,561	(20)	1,251	12,185
2031	70,274	5,622		5,798	(18)	1,304	12,706
PV ⁽¹⁾	\$ 380,702	\$ 30,456	\$ (3,321)	\$ 31,408	\$ (460)	\$ 7,082	\$ 65,165
Level Rate ⁽²⁾		8.000%	(0.872)%	8.250%	(0.121)%	1.860%	17.117%

Note:

(1) Present Value as of the valuation date, of 30-year series of contributions and appropriations.

(2) Equivalent level rate payable over the 30-year period.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 13
AMORTIZATION OF UNFUNDED ACTUARIAL OBLIGATION

<i>\$(Millions)</i>		Beginning Unfunded Act. Oblig.	Amortization Payment			Interest Charge at 8%	Ending Unfunded Act. Oblig.
Year	FYE		Total Contrib.	Normal Cost	Available Credit		
1	2002	\$ 2,227	\$ 3,341	\$ 3,467	\$ (126)	\$ 183	\$ 2,536
2	2003	2,536	3,514	3,615	(101)	207	2,844
3	2004	2,844	3,640	3,768	(128)	233	3,205
4	2005	3,205	3,796	3,928	(132)	262	3,599
5	2006	3,599	3,958	4,095	(137)	293	4,030
6	2007	4,030	4,127	4,269	(142)	328	4,500
7	2008	4,500	4,304	4,451	(147)	366	5,013
8	2009	5,013	4,488	4,640	(152)	407	5,573
9	2010	5,573	4,680	4,837	(157)	452	6,182
10	2011	6,182	5,185	5,043	142	489	6,529
11	2012	6,529	5,725	5,257	468	504	6,564
12	2013	6,564	5,970	5,480	490	506	6,580
13	2014	6,580	6,226	5,713	513	506	6,573
14	2015	6,573	6,493	5,956	537	504	6,541
15	2016	6,541	6,772	6,209	562	501	6,479
16	2017	6,479	7,062	6,473	589	495	6,385
17	2018	6,385	7,366	6,748	617	486	6,254
18	2019	6,254	7,682	7,035	647	474	6,082
19	2020	6,082	8,011	7,334	677	459	5,865
20	2021	5,865	8,355	7,646	709	441	5,596
21	2022	5,596	8,713	7,971	742	418	5,272
22	2023	5,272	9,087	8,310	777	391	4,885
23	2024	4,885	9,477	8,663	813	358	4,430
24	2025	4,430	9,882	9,031	851	320	3,899
25	2026	3,899	10,306	9,415	890	276	3,284
26	2027	3,284	10,747	9,815	932	225	2,578
27	2028	2,578	11,207	10,232	974	167	1,771
28	2029	1,771	11,686	10,667	1,019	101	853
29	2030	853	12,185	11,120	1,065	26	(186)
30	2031	(186)	12,706	11,593	1,113	(59)	(1,358)



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 14
FUNDING SUFFICIENCY FOR DB PROGRAM

(\$Millions)	June, 2001	June, 2000
Funded Status (Table 8)		
Actuarial Obligation	\$109,881	\$ 93,124
Actuarial Value of Assets	<u>107,654</u>	<u>102,225</u>
Unfunded Actuarial Obligation (Actuarial Surplus)	\$ 2,227	\$ (9,101)
Funded Ratio	98%	110%
Source of Income (Table 10)	17.117%	19.260% ⁽¹⁾
Amortization Period		
Normal Cost Rate	16.497%	16.001%
Amortization Rate	<u>0.620</u>	<u>3.259</u>
Total Level Rate over the Amortization Period	17.117%	19.260%
<i>Amortization Period</i>	<i>29 years</i>	<i>n/a</i>
30-Year Funding Period		
Normal Cost Rate	16.497%	16.001%
Amortization Rate over 30 Years	<u>0.585</u>	<u>(2.700)</u>
Total Level Rate over the Amortization Period	17.082%	13.301% ⁽²⁾
Conclusion as of June 30, 2001:		
<ul style="list-style-type: none"> The level percentage of salaries available over the next 30 years is sufficient to fund the DB Program (assuming the currently deferred investment losses are offset by future investment gains over the funding period). 		

Note:

(1) Documented in the 2000 actuarial valuation

(2) Level 30-year rate as of 2000 is shown before the 2000 Benefits Increase.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

SECTION 3

OUTLINE OF THE PROVISIONS OF GOVERNING LAW

All of the actuarial calculations contained in this report are based upon our understanding of the Defined Benefit (DB) Program of the State Teachers' Retirement Plan as contained in Part 13 of the California Education Code. The provisions used in this valuation are summarized below for reference purposes.

NORMAL RETIREMENT

Eligibility Requirement:	Age 60 with five years of credited service.
Allowance:	Two percent of final compensation for each year of credited service.
Final Compensation:	Average salary earnable for the highest three consecutive years of credited service for one position. For members with 25 years of service, the calculation is based on the highest average compensation earnable in a consecutive 12-month period.
Credited Service:	For each year of membership, credited service is granted based on the ratio of salary earned to full-time salary earnable for one position.
Sick Leave Service Credit:	Credited service is granted for unused sick leave at the time of retirement. Sick Leave Service Credit can not be used for eligibility for One-Year Final Compensation, the Career Bonus, nor the Longevity Bonus.
Career Bonus:	If a member has thirty years of credited service, the age factor is increased by 0.2%. However, the maximum age factor is 2.4%.
Longevity Bonus:	For members attaining 30 years of service by January 1, 2011, a longevity bonus of \$200 per month is added to the unmodified allowance. The bonus is increased to \$300 per month with 31 years of service, and \$400 per month with 32 or more years of service.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

IRC Section 415: Benefits are subject to limits imposed under Internal Revenue Code (IRC) Section 415. However, no limits are imposed in the valuation of the DB Program in order to address the potential pay-as-you-go funding needs of the Teachers' Replacement Benefits Program Fund.

EARLY RETIREMENT

Eligibility Requirement: Age 55 with five years of credited service, or age 50 with 30 years of credited service.

Benefit Reduction: A 1/2% reduction in the normal retirement allowance for each full month or partial month the member is younger than age 60, plus a reduction of 1/4% for each full month or partial month the member is younger than age 55.

LATE RETIREMENT

Allowance: Members continue to earn additional service credit after age 60. The 2% age factor increases by 0.033% for each quarter year of age that the member is over age 60, up to a maximum of 2.4%.

DEFERRED RETIREMENT

Allowance: Any time after satisfying the minimum service requirement, a member may cease active service, leave the accumulated contributions on deposit, and later retire upon attaining the minimum age requirement.

POST-RETIREMENT BENEFIT ADJUSTMENT

Benefit Improvement: Two percent simple increase on September 1 following the first anniversary of the effective date of the allowance, applied to all continuing allowances.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

DISABILITY ALLOWANCE - COVERAGE A

Eligibility Requirement:	Member has five years of credited California service and has not attained age 60.
Allowance:	Fifty percent of final compensation or 5% of final compensation for each year of service credit if over age 45 with less than 10 years of service credit.
Children's Benefit:	10% for each eligible dependent child, up to a maximum of 40% of final compensation. The increment for each eligible child continues until the child marries or attains age 22. Beginning in 2002, children not registered as full-time students will retain eligibility only up to age 18.
Offsets:	Allowance, including children's increment, is reduced by disability benefits payable under Social Security, Workers' Compensation and district-paid income protection plan.

DISABILITY ALLOWANCE - COVERAGE B

Eligibility Requirement:	Member has five years of credited California service.
Allowance:	Fifty percent of final compensation, regardless of age and service credit.
Children's Benefit:	10% for each eligible child up to four children, for a maximum of 40% of final compensation. The increment for each child continues until the child attains age 21, regardless of student, marital, or employment status.
Offsets:	The member's allowance is reduced by disability benefits payable under Workers' Compensation.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

DEATH BEFORE RETIREMENT - COVERAGE A

Eligibility Requirement:	One or more years of service credit for active members or members receiving a disability allowance.
Lump Sum Payment:	\$6,010 lump sum to the designated beneficiary. If there is no surviving spouse or eligible children, the contributions and interest are paid to the designated beneficiary.
Allowance:	<p>The surviving spouse with eligible children will receive a family benefit of 40% of final compensation for as long as there is at least one eligible child. An additional 10% of final compensation is payable for each eligible child up to a maximum benefit of 90%.</p> <p>If there is no surviving spouse, an allowance of 10% of final compensation is payable to eligible children up to a maximum benefit of 50%.</p> <p>When there are no eligible children, the spouse may elect to receive one half of a 50% joint and survivor allowance projected to age 60, or take a lump sum payment of the remaining contributions and interest.</p>

DEATH BEFORE RETIREMENT - COVERAGE B

Eligibility:	One or more years of service credit for active members.
Lump Sum Payment:	\$24,040 lump sum to the designated beneficiary. If there is no surviving spouse, the contributions and interest are paid to the designated beneficiary.
Allowance:	<p>A lump sum payment of the contributions and interest.</p> <p>or</p> <p>One half of a 50% joint and survivor allowance, beginning on the member's 60th birthday, or</p>



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

immediately with a reduction based on the member and spouse's age at the time the benefit begins.

If the surviving spouse elects a monthly allowance, each eligible child would receive 10% of the member's final compensation, with a maximum benefit of 50%.

DEATH AFTER RETIREMENT

Lump Sum Payment:

\$6,010 lump sum to the designated beneficiary.

Annuity Form:

If the retirant had elected one of the joint and survivor options, the retirement allowance would be modified in accordance with the option selected.

If no option had been elected, payment of the unpaid contributions and interest, if any, remaining in the retirant's account.

TERMINATION FROM SYSTEM

Refund:

Refund of contributions with interest as credited to the member's account to date of withdrawal. A refund terminates membership and all rights to future benefits from the System.

Re-entry After Refund:

Former members who re-enter the System, may redeposit all amounts previously refunded plus regular interest. The member must earn one year of credited service after re-entry before becoming eligible for System benefits.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

SECTION 4

ACTUARIAL METHODS AND ASSUMPTIONS

This section of the report describes the actuarial methods and assumptions used in this valuation. The Teachers' Retirement Board has chosen these actuarial methods and assumptions based on our recommendations. The Board has the sole authority to select the methods and assumptions used in this actuarial valuation. In our opinion, the current methods and actuarial assumptions are reasonable and appropriate for the DB Program.

ACTUARIAL COST METHOD

The accruing costs of all benefits are measured by the Entry Age Actuarial Cost Method. The actuarial present value of projected benefits for each individual member included in the valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Normal Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future Normal Costs is called the Actuarial Obligation. The excess of the Actuarial Obligation over the Actuarial Value of Assets is called the Unfunded Actuarial Obligation. If the Actuarial Value of Assets exceeds the Actuarial Obligation, the difference is called the Actuarial Surplus.

The ages at entry of future active members are assumed to average the same as the entry ages of the present active members they replace. If the number of active members should increase (or decrease), it is further assumed that the average entry age of the larger (or smaller) group will be the same, from an actuarial standpoint, as that of the present active group. Under these assumptions, the Normal Cost Rate will not vary with the termination of the present active membership, or with an expansion or contraction of the active membership.

ASSET VALUATION METHOD

The assets are valued using a method that delays recognition of investment gains or losses. The expected actuarial value is the prior year's actuarial value increased with net cash flow of funds, and all increased with interest during the past year at the expected investment return assumption. One-third of the difference between the expected actuarial value of assets and the Fair Market Value of assets is added to the expected actuarial value of assets to arrive at the Actuarial Value of Assets.

The asset smoothing method was adopted for the 1999 actuarial valuation and is effective for the investment experience beginning in July of 1993.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

ACTUARIAL ASSUMPTIONS

The economic assumptions have been developed in accordance with the Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. The demographic assumptions adopted for this program were developed from recent experience and expectations of future trends, and in accordance with the Actuarial Standard of Practice No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*.

The assumptions are intended to estimate the future experience of the members of the DB Program and of the System itself in areas which affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in estimated costs of the Program's benefits.

The demographic assumptions are listed in **TABLE 15** and illustrated at selected ages and duration combinations in **TABLES 16 - 21**.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 15
OUTLINE OF ACTUARIAL ASSUMPTIONS

I. Economic Assumptions

A.	Investment Return (net of investment and administrative expenses)	8.00%
B.	Interest on Member Accounts	6.00%
C.	Wage Growth	4.25%
D.	Inflation	3.50%

II. Demographic Assumptions

A.	Mortality		
	(1) Active	- Male	1999 CalSTRS Retired – M (-2 years) Table 16
		- Female	1999 CalSTRS Retired – F (-2 years) Table 16
	(2) Retired *	- Male	1999 CalSTRS Retired – M Table 16
		- Female	1999 CalSTRS Retired – F Table 16
	(3) Beneficiary *	- Male	1999 CalSTRS Beneficiary – M Table 16
		- Female	1999 CalSTRS Beneficiary – F Table 16
	(4) Pre-1972 Disabled	- Male	1951 GA Table – M (-1 year) Table 16
		- Female	1951 GA Table – M (-7 years) Table 16
	(5) Disabled	- Male	1994 GAM-M (minimum 2.5% with select rates in first three years) Table 16
		- Female	1994 GAM-F (minimum 2.2% with select rates in first three years) Table 16

* *Future retirants and beneficiaries are valued with a 2-year age setback*

B.	Service Retirement	Experience Tables	Table 17
C.	Disability Retirement	Experience Tables	Table 18
D.	Withdrawal	Experience Tables	Table 19
	Probability of Refund	Experience Tables	Table 20
E.	Merit Salary Increases	Experience Tables	Table 21



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 16
MORTALITY RATES**

<u>Active Participants</u>			<u>Retired Participants</u>		
<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Age</u>	<u>Male</u>	<u>Female</u>
25	0.051%	0.029%	50	0.190%	0.121%
30	0.066	0.029	55	0.321	0.191
35	0.080	0.037	60	0.558	0.336
40	0.085	0.051	65	1.015	0.668
45	0.107	0.077	70	1.803	1.176
50	0.158	0.103	75	2.848	1.834
55	0.258	0.157	80	5.021	3.778
60	0.443	0.256	85	9.419	6.503
65	0.798	0.509	90	14.754	11.627
			95	23.361	18.621

<u>Age</u>	<u>Beneficiaries</u>		<u>Pre-1972 Disabled</u>		<u>Disabled (After Year 3)</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
50	0.233%	0.121%	0.581%	0.277%	2.500%	2.200%
55	0.398	0.191	0.956	0.518	2.500	2.200
60	0.709	0.336	1.438	0.873	2.500	2.200
65	1.294	0.668	2.207	1.330	2	2.200
70	2.173	1.176	3.594	2.007	0	2.200
75	3.405	1.834	5.708	3.299	4.517	2.533
80	5.586	3.778	9.095	5.208	7.553	4.395
85	8.961	6.503	13.707	8.269	11.567	7.535
90	14.754	11.627	18.892	12.744	18.228	12.875
95	23.361	18.621	25.277	17.779	26.882	20.254
Select rates for disability:						
First year of disablement					11.4%	6.0%
Second year of disablement					7.7	3.8
Third year of disablement					6.2	3.0



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 17
SERVICE RETIREMENT**

<u>Age</u>	<u>For the 1990 Benefit Structure</u>		<u>For the Post-1990 Benefit Increases</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
54	1.5%	1.5%	1.5%	1.5%
55	5.8	7.0	5.0	6.0
56	3.9	4.5	3.5	4.0
57	4.9	4.5	4.0	4.0
58	6.8	7.0	6.0	6.0
59	17.5	14.0	15.0	9.0
60	25.0	22.0	20.0	12.0
61	16.5	15.0	14.0	13.0
62	16.5	15.0	14.0	17.0
63	15.0	15.0	25.0	25.0
64	17.5	18.0	25.0	25.0
65	20.0	18.0	20.0	19.0
66	16.0	18.0	16.0	16.0
67	16.0	18.0	16.0	16.0
68	16.0	16.0	16.0	16.0
69	16.0	16.0	16.0	16.0
70	100.0	100.0	100.0	100.0



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 18
DISABILITY RETIREMENT**

Coverage A		
Age	Male	Female
25	0.021%	0.021%
30	0.030	0.030
35	0.051	0.060
40	0.081	0.090
45	0.111	0.111
50	0.159	0.219
55	0.210	0.279

Coverage B				
Age	Entry Ages - Male		Entry Ages - Female	
	Under 40	40 and Up	Under 40	40 and Up
25	0.021%		0.030%	
30	0.030		0.030	
35	0.051		0.051	
40	0.120		0.090	
45	0.150	0.196%	0.141	0.231%
50	0.195	0.288	0.231	0.360
55	0.270	0.390	0.318	0.459
60	0.330	0.529	0.390	0.588
65	0.380	0.852	0.459	0.915



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 19
WITHDRAWAL**

Entry Ages - Male					
<u>Year</u>	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 and Up</u>
1	12.5%	12.5%	12.5%	12.5%	12.5%
2	9.5	9.5	9.2	9.2	9.5
3	7.7	6.8	6.8	6.8	7.2
4	5.8	5.8	5.8	5.8	6.2
5	5.0	4.2	4.2	4.2	4.2
10	2.0	2.0	2.0	2.0	2.4
15	1.1	1.1	1.1	1.2	
20	0.6	0.6	0.6		
25	0.5	0.5			
30	0.0				
Entry Ages - Female					
<u>Year</u>	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 and Up</u>
1	10.0%	10.0%	10.0%	10.0%	10.0%
2	8.3	8.3	8.3	7.5	6.8
3	7.7	7.3	6.5	5.5	5.3
4	7.1	7.1	5.6	4.5	4.0
5	5.5	5.8	4.2	3.5	3.0
10	2.3	2.0	1.7	1.4	1.6
15	1.1	0.9	1.0	0.9	
20	0.6	0.7	0.9		
25	0.6	0.6			
30	0.0				



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 20
PROBABILITY OF REFUND**

Entry Ages - Male					
<u>Year</u>	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 and Up</u>
Under 5	100%	100%	100%	100%	100%
10	50	40	40	45	40
15	40	40	35	35	
20	35	35	30		
25	25	20			
30	20				
Entry Ages - Female					
<u>Year</u>	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 and Up</u>
Under 5	100%	100%	100%	100%	100%
10	25	25	30	30	25
15	20	20	30	20	
20	20	20	20		
25	20	20			
30	15				



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 21
MERIT SALARY INCREASES

Yr.	Entry Age - Annual Increase in Salaries Due to Merit					
	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 - 44</u>	<u>45 & up</u>
1	5.7%	5.3%	5.1%	4.9%	4.9%	3.5%
2	5.6	5.2	4.9	4.7	4.7	3.3
3	5.6	5.0	4.8	4.6	4.6	3.0
4	5.5	4.9	4.6	4.4	4.4	2.9
5	5.5	4.8	4.5	3.8	3.8	2.6
10	3.2	3.0	2.7	2.3	2.2	1.6
15	1.5	1.5	1.4	1.1	1.1	0.8
20	1.3	1.2	1.1	0.8	0.8	0.6
25	1.1	1.0	0.9	0.6	0.6	
30	0.9	0.7	0.6	0.5		
35	0.8	0.7	0.6			
40	0.8	0.7				
45	0.8					



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

SECTION 5 VALUATION DATA

The membership data for this actuarial valuation was supplied by the System and accepted without audit. We have examined the data for reasonableness and consistency with prior valuations and periodic reports from the CalSTRS staff to the Teachers' Retirement Board.

We believe the membership data to be sufficient for the purposes of this valuation.

TABLES 22 - 27 summarize the census data used in this valuation.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

TABLE 22
SUMMARY OF STATISTICAL INFORMATION

	June 30, 2001	June 30, 2000
Number of Members		
Active Members ⁽¹⁾	428,741	420,530
Inactive Members ⁽¹⁾	87,146	75,580
Retirees and Beneficiaries		
Service Retirants	149,727	145,415
Disabilitants	6,477	5,885
Survivors	<u>14,768</u>	<u>13,982</u>
Total	170,972	165,282
Total Membership in Valuation	686,859	661,392
Active Member Statistics		
Earned Salaries	\$20,494 million	\$18,224 million
Average Salary	\$ 47,801	\$ 43,336
Average Age	44.3 years	44.2 years
Average Service	10.7 years	10.7 years

Note:

- ⁽¹⁾ Some active members were reported with no Earnable Salaries, in which case their liabilities, if any, were included with inactive members



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 23
ACTIVE MALE MEMBERS**

<u>AGE</u>	<u>SERVICE</u>					
	<u>UNDER 1</u>	<u>1 - 5</u>	<u>6 - 10</u>	<u>11 - 15</u>	<u>16 - 20</u>	<u>21 - 25</u>
Under 25	404	711	1			
25 to 30	1,224	9,423	184			
30 to 35	937	10,945	4,073	119		
35 to 40	737	6,467	4,286	2,557	98	
40 to 45	713	4,967	2,974	3,673	1,931	98
45 to 50	760	4,728	2,656	3,270	2,832	2,764
50 to 55	742	4,631	2,588	2,972	2,507	3,895
55 to 60	545	2,839	1,593	1,839	1,500	1,678
60 to 65	218	1,417	616	742	568	551
65 to 70	126	558	237	201	176	136
70 & Up	76	362	110	75	55	47
Unknown	3	10	1			
Total	6,485	47,058	19,319	15,448	9,667	9,169

<u>AGE</u>	<u>SERVICE</u>					<u>TOTAL</u>
	<u>26 - 30</u>	<u>31 - 35</u>	<u>36 - 40</u>	<u>41 - 45</u>	<u>OVER 45</u>	
Under 25						1,116
25 to 30						10,831
30 to 35						16,074
35 to 40						14,145
40 to 45						14,356
45 to 50	214					17,224
50 to 55	5,487	514				23,336
55 to 60	4,219	4,805	371			19,389
60 to 65	944	1,628	1,108	28		7,820
65 to 70	190	216	217	104	3	2,164
70 & Up	40	58	40	53	18	934
Unknown						14
Total	11,094	7,221	1,736	185	21	127,403



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 24
ACTIVE FEMALE MEMBERS**

<u>AGE</u>	<u>SERVICE</u>					
	<u>UNDER 1</u>	<u>1 - 5</u>	<u>6 - 10</u>	<u>11 - 15</u>	<u>16 - 20</u>	<u>21 - 25</u>
Under 25	1,573	3,788				
25 to 30	2,936	32,041	906			
30 to 35	1,729	24,821	12,247	539		
35 to 40	1,546	13,068	9,217	7,442	375	
40 to 45	1,512	12,331	7,265	8,015	4,865	291
45 to 50	1,547	12,916	8,093	8,526	6,292	5,981
50 to 55	1,169	10,581	7,907	10,068	6,735	6,911
55 to 60	640	5,405	4,155	6,183	5,130	4,565
60 to 65	239	1,859	1,310	2,009	1,961	2,041
65 to 70	97	637	337	483	474	528
70 & Up	52	395	155	154	144	150
Unknown	24	388	21			
Total	13,064	118,230	51,613	43,419	25,976	20,467

<u>AGE</u>	<u>SERVICE</u>					<u>TOTAL</u>
	<u>26 - 30</u>	<u>31 - 35</u>	<u>36 - 40</u>	<u>41 - 45</u>	<u>OVER 45</u>	
Under 25						5,361
25 to 30						35,883
30 to 35						39,336
35 to 40						31,648
40 to 45						34,279
45 to 50	440					43,795
50 to 55	8,027	1,255				52,653
55 to 60	5,052	6,736	720			38,586
60 to 65	1,700	1,827	1,245	55		14,246
65 to 70	451	351	203	100	11	3,672
70 & Up	108	139	68	47	34	1,446
Unknown						433
Total	15,778	10,308	2,236	202	45	301,338



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 25
ALL ACTIVE MEMBERS**

<u>AGE</u>	<u>SERVICE</u>					
	<u>UNDER 1</u>	<u>1 - 5</u>	<u>6 - 10</u>	<u>11 - 15</u>	<u>16 - 20</u>	<u>21 - 25</u>
Under 25	1,977	4,499	1			
25 to 30	4,160	41,464	1,090			
30 to 35	2,666	35,766	16,320	658		
35 to 40	2,283	19,535	13,503	9,999	473	
40 to 45	2,225	17,298	10,239	11,688	6,796	389
45 to 50	2,307	17,644	10,749	11,796	9,124	8,745
50 to 55	1,911	15,212	10,495	13,040	9,242	10,806
55 to 60	1,185	8,244	5,748	8,022	6,630	6,243
60 to 65	457	3,276	1,926	2,751	2,529	2,592
65 to 70	223	1,195	574	684	650	664
70 & Up	128	757	265	229	199	197
Unknown	27	398	22			
Total	19,549	165,288	70,932	58,867	35,643	29,636

<u>AGE</u>	<u>SERVICE</u>					<u>TOTAL</u>
	<u>26 - 30</u>	<u>31 - 35</u>	<u>36 - 40</u>	<u>41 - 45</u>	<u>OVER 45</u>	
Under 25						6,477
25 to 30						46,714
30 to 35						55,410
35 to 40						45,793
40 to 45						48,635
45 to 50	654					61,019
50 to 55	13,514	1,769				75,989
55 to 60	9,271	11,541	1,091			57,975
60 to 65	2,644	3,455	2,353	83		22,066
65 to 70	641	567	420	204	14	5,836
70 & Up	148	197	108	100	52	2,380
Unknown						447
Total	26,872	17,529	3,972	387	66	428,741



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 26
INACTIVE MEMBERS**

<u>FISCAL YEAR ENDING JUNE 30</u>	<u>NUMBER VESTED</u>	<u>TOTAL NUMBER</u>	<u>MALE % OF TOTAL</u>	<u>FEMALE % OF TOTAL</u>
1992	11,446	50,898	28.0	72.0
1993	11,777	51,094	27.3	72.7
1994	12,318	53,222	27.2	72.8
1995	12,724	54,159	26.7	73.3
1996	13,261	56,424	26.8	73.2
1997	13,925	59,385	27.2	72.8
1998	14,038	61,848	27.4	72.6
1999	15,421	69,112	27.7	72.3
2000	16,211	75,580	27.8	72.2
2001	18,469	87,146	28.1	71.9

<u>FISCAL YEAR ENDING JUNE 30</u>	<u>AVERAGE ACCOUNT ON DEPOSIT</u>	<u>AVERAGE AGE</u>	<u>AVERAGE SERVICE CREDIT</u>	<u>AVERAGE YEARS INACTIVE</u>
1992	\$ 8,312	48.3	3.5	8.0
1993	9,078	48.1	3.6	8.1
1994	9,607	47.9	3.5	8.2
1995	10,282	47.4	3.6	8.0
1996	10,931	47.2	3.5	8.0
1997	11,431	47.3	3.5	8.2
1998	11,731	47.5	3.4	8.3
1999	12,105	47.1	3.3	8.0
2000	12,325	46.8	3.2	7.8
2001	12,889	50.7	3.2	8.2



**California State Teachers' Retirement System
Defined Benefit Program - 2001 Actuarial Valuation**

**TABLE 27
SERVICE RETIRANTS**

<u>FISCAL YEAR ENDING JUNE 30</u>	<u>TOTAL</u>	<u>MALE % OF TOTAL</u>	<u>FEMALE % OF TOTAL</u>
1992	118,963	37.1	62.9
1993	122,762	37.6	62.4
1994	126,476	37.9	62.1
1995	130,576	38.1	61.9
1996	133,764	38.2	61.8
1997	135,809	38.3	61.7
1998	139,193	38.3	61.7
1999	142,309	38.3	61.7
2000	145,415	38.1	61.9
2001	149,727	38.0	62.0

<u>FISCAL YEAR ENDING JUNE 30</u>	<u>AVERAGE AGE AT RETIREMENT</u>	<u>AVERAGE YEARS OF SERVICE CREDIT</u>	<u>FINAL AVERAGE COMPENSATION</u>	<u>AVERAGE CURRENT ALLOWANCE PAYABLE</u>
1992	60.8	24.2	\$ 2,285	\$ 1,217
1993	60.9	24.3	2,414	1,297
1994	60.9	24.5	2,532	1,369
1995	60.9	24.6	2,637	1,434
1996	60.9	24.7	2,743	1,502
1997	60.8	24.8	2,837	1,566
1998	60.8	24.7	2,945	1,638
1999	60.7	24.8	3,057	1,729
2000	60.7	25.0	3,175	1,824
2001	60.7	25.4	3,356	2,033



California State Teachers' Retirement System

Defined Benefit Program - 2001 Actuarial Valuation

SECTION 6

GLOSSARY OF ACTUARIAL TERMINOLOGY

Actuarial Assumptions:	Assumptions as to the occurrence of future events affecting pension costs, such as mortality, withdrawal, disablement, and retirement, changes in compensation, rates of investment earnings and asset appreciation or depreciation, procedures used to determine the Actuarial Value of Assets, and other relevant items.
Actuarial Cost Method:	A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Obligation.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.
Actuarial Obligation:	That portion, as determined by a particular Actuarial Cost method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.
Actuarial Present Value:	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.
Actuarial Surplus:	The excess, if any, of the Actuarial Value of Assets over the Actuarial Obligation.
Actuarial Valuation:	The determination, as of a Valuation Date, of the Normal Cost, Actuarial Obligation, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.



California State Teachers' Retirement System Defined Benefit Program - 2001 Actuarial Valuation

Actuarial Value of Assets:	The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.
Actuarial Equivalent:	Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
Entry Age Cost Method:	An actuarial cost method under which the Actuarial Present Value of Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Obligation.
Normal Cost:	The portion of the Actuarial Present Value of Projected Benefits which is allocated to a valuation year by the Actuarial Cost Method.
Unfunded Actuarial Obligation:	The excess, if any, of the Actuarial Obligation over the Actuarial Value of Assets.
Valuation Date:	June 30, 2001.